Game Design Patterns for Instructional Design and Research

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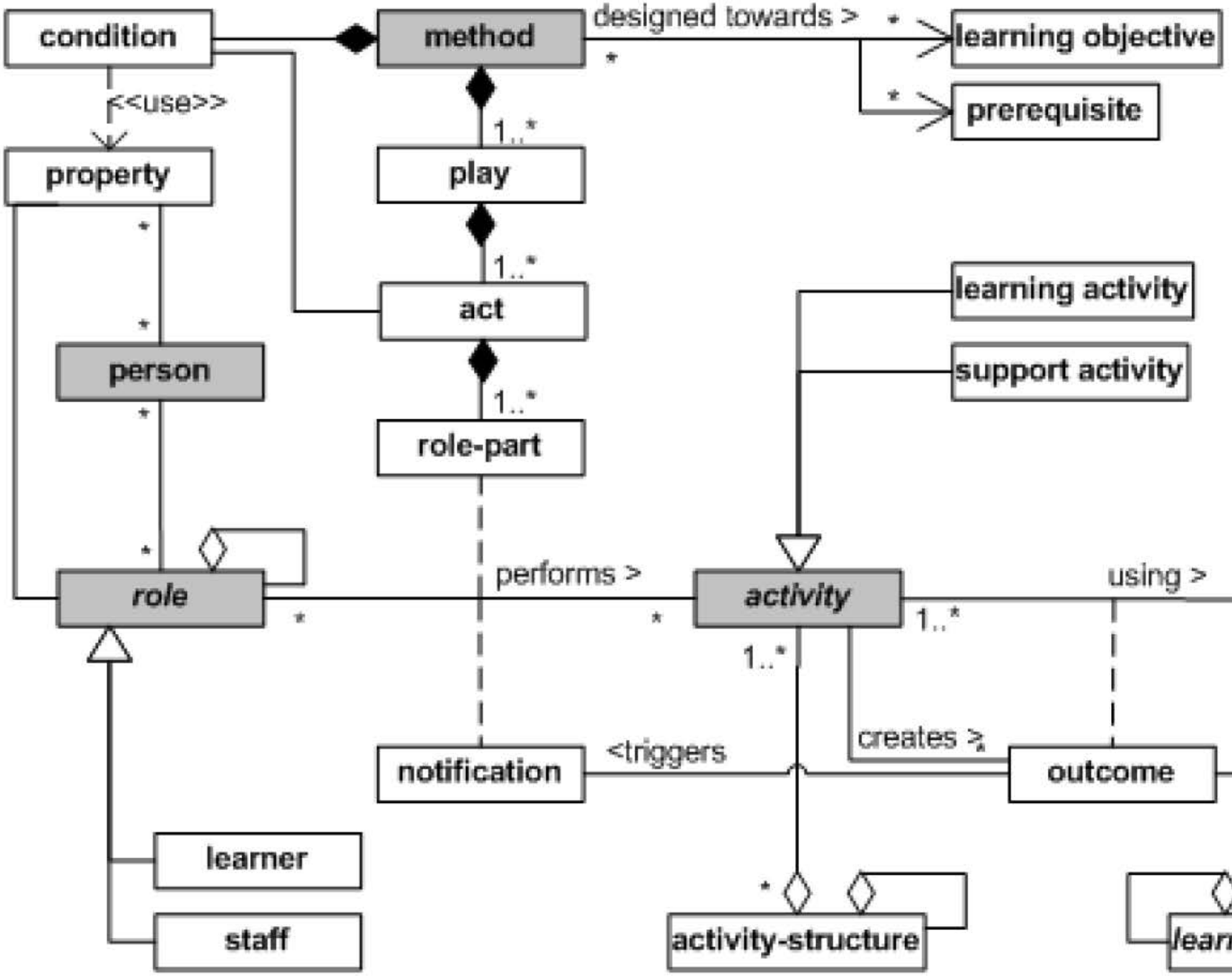
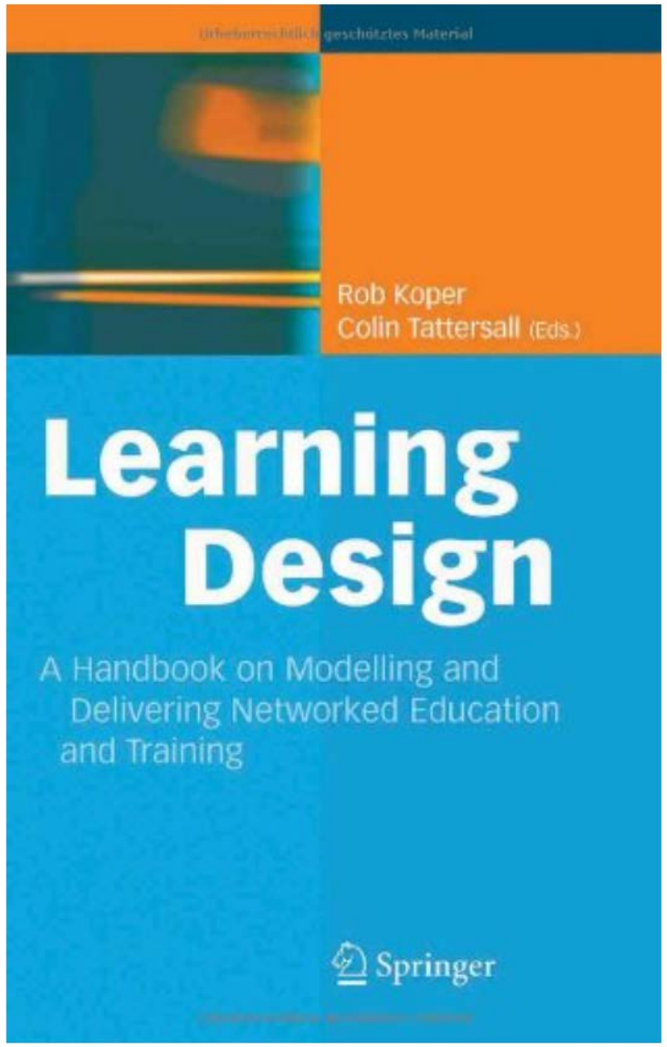
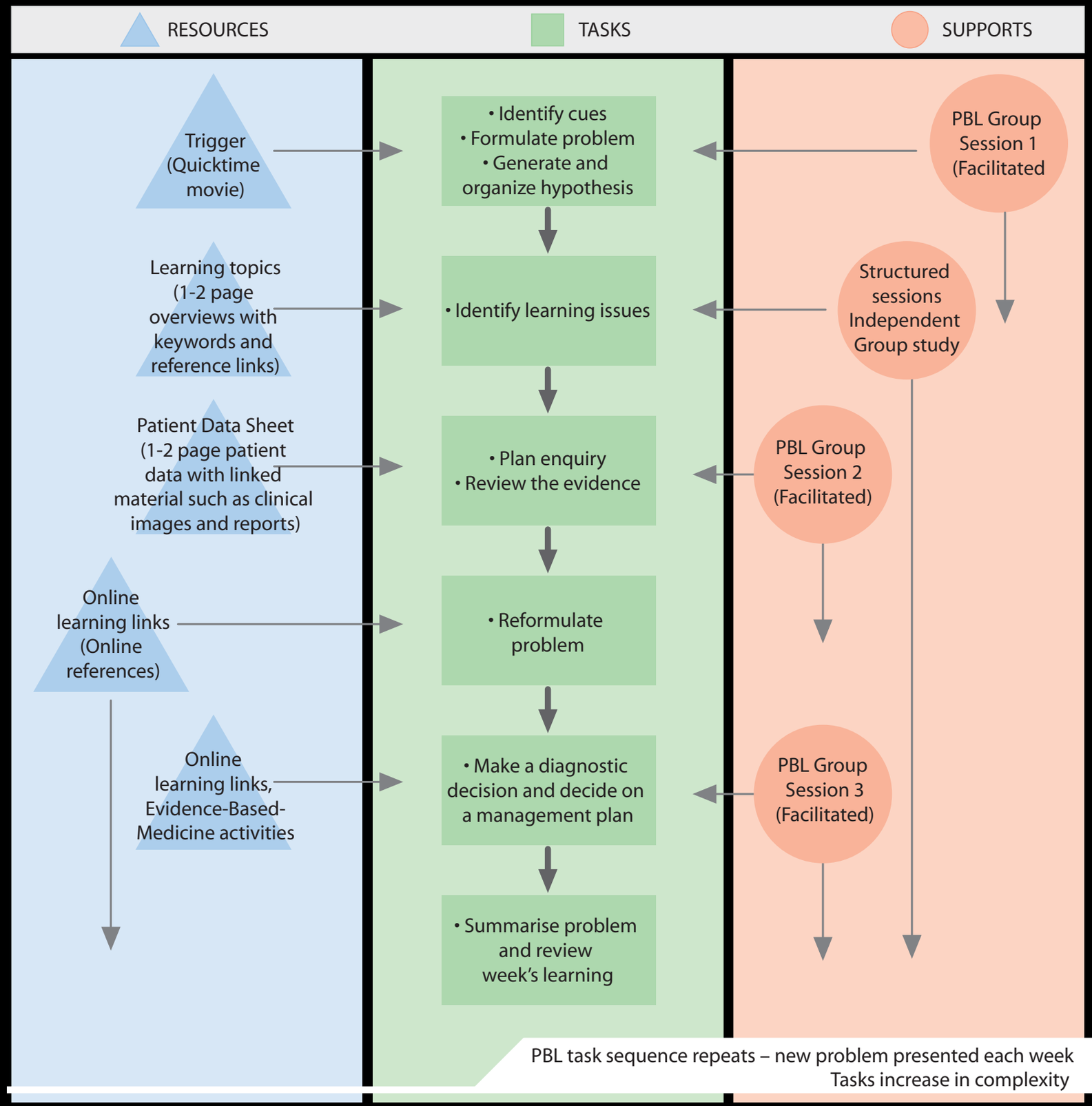
PROF. DR. MARCUS SPECHT
WELTEN INSTITUTE
RESEARCH CENTRE FOR LEARNING, TEACHING AND TECHNOLOGY
OPEN UNIVERSITEIT NEDERLAND
MARCUS.SPECHT@OU.NL
TWITTER, FLICKR, FACEBOOK: MARCUSPECHT

#1 INSTRUCTIONAL DESIGN AND GAME DESIGN PATTERNS

learning design

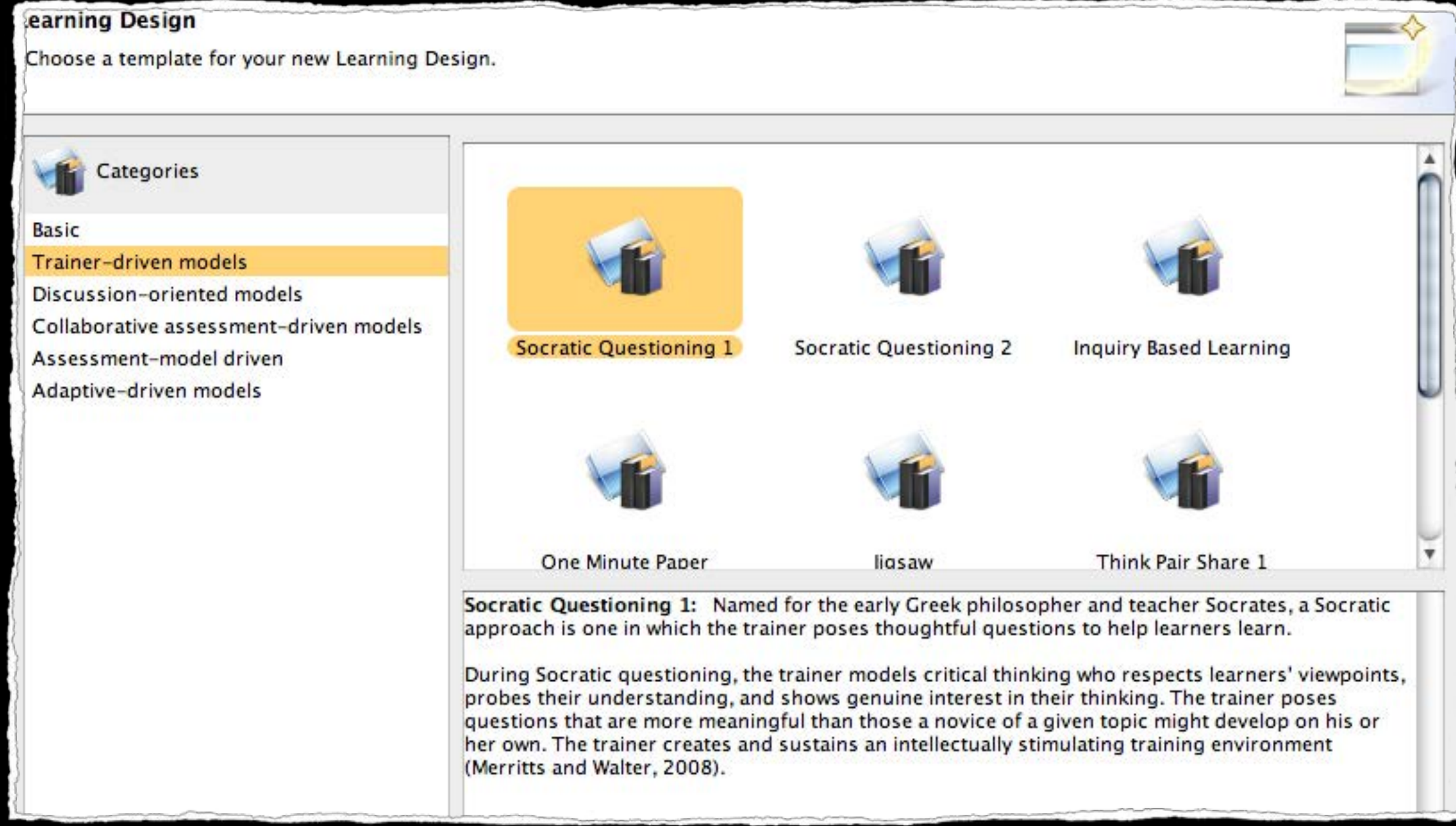




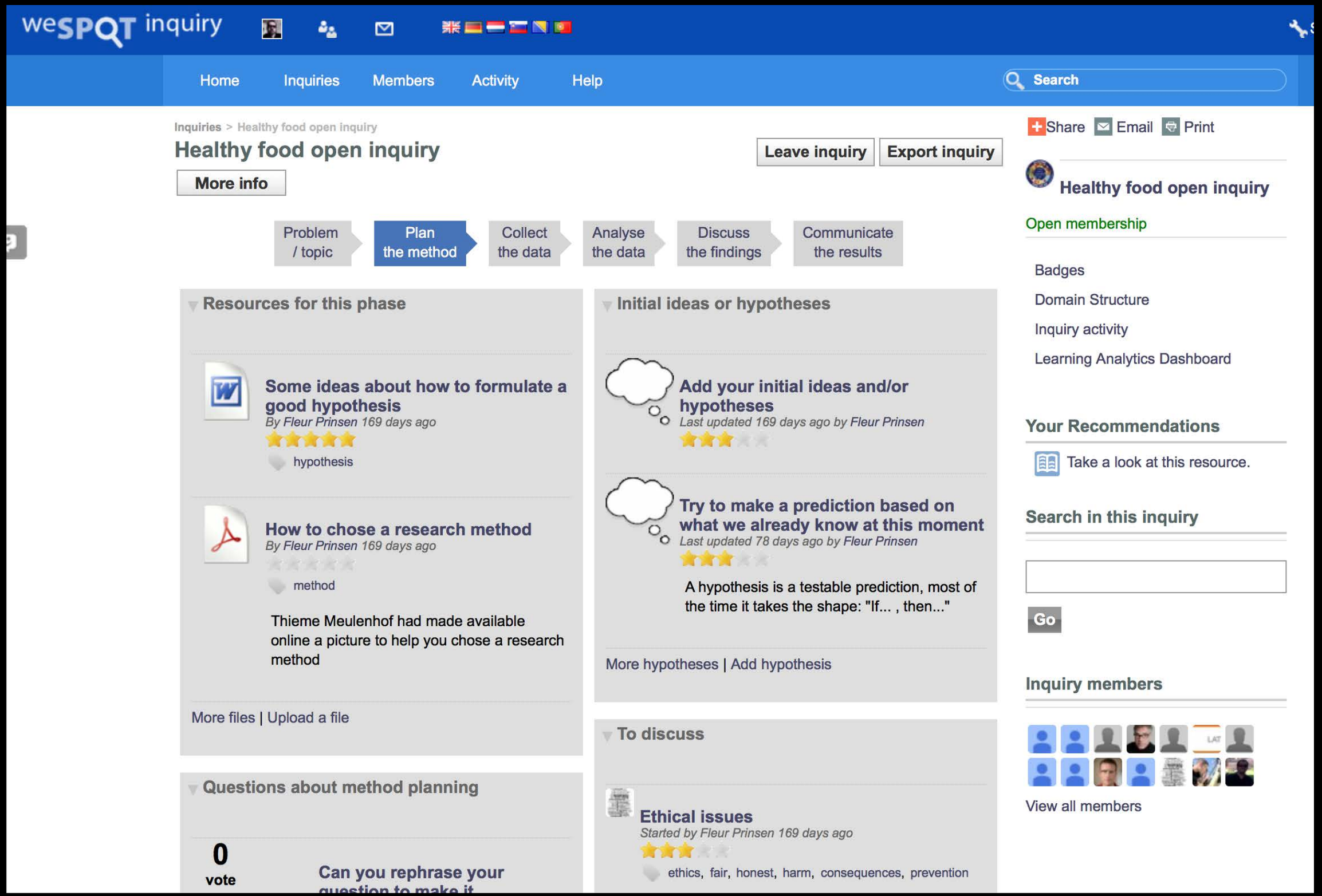


Best practice analysis, with simple metaphors

http://www.learningdesigns.uow.edu.au/project/index.htm



Templates for Educators



PLEs and Widget Learning Activity

#2 GAME DESIGN PATTERNS

Table 2.1.: Overview of game design pattern categories

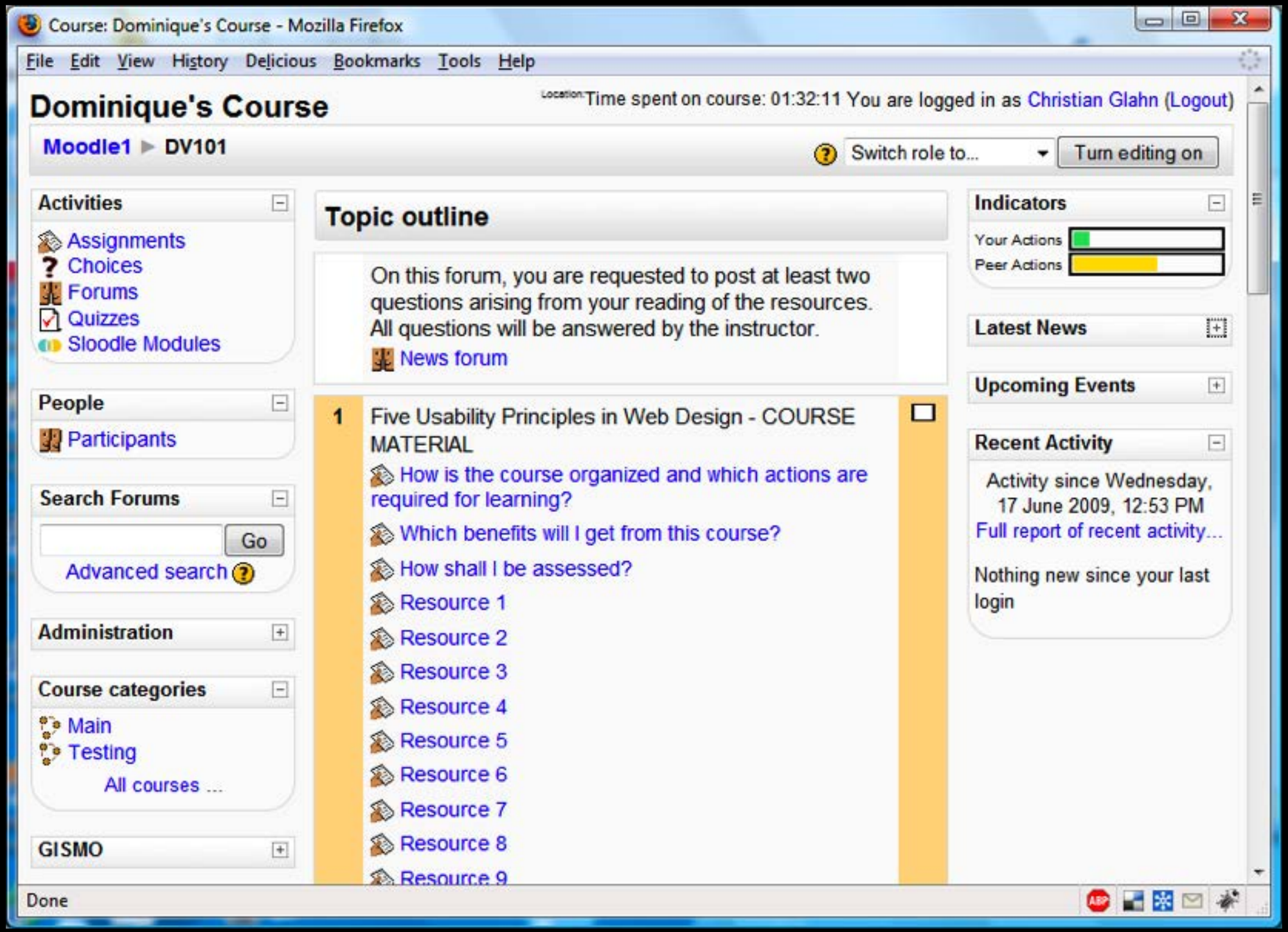
	Pattern Category	Description
1	Game Elements Patterns	These patterns describe game objects that define the area of the game reality or that players can manipulate. (48 patterns) (for example: clues)
2	Patterns for Resources and Resource Management	These patterns describe different types of resources that can be controlled by the players and the game system. (20 patterns) (for example: resources)
3	Patterns for Information, Communication and Presentation	These patterns describe how information about the game state is treated, for instance hiding of specific information of for carrying out evaluations. (20 patterns) (for example: asymmetric information)
4	Actions and Events Patterns	These patterns govern what kinds of actions are available to players, how they relate to changes in the game state, and how they relate to the goals of the players. (44 patterns) (for example: rewards or penalties)
5	Patterns for Narrative Structures, Predictability and Immersion	These patterns deal with storyline, immersion and commitment to the game by the players. (31 patterns) (for example: surprises)

how can we use powerful game patterns in designing educational artefacts ?

Table 2.3.: Mapping of "Preparation" learning functions onto game design patterns

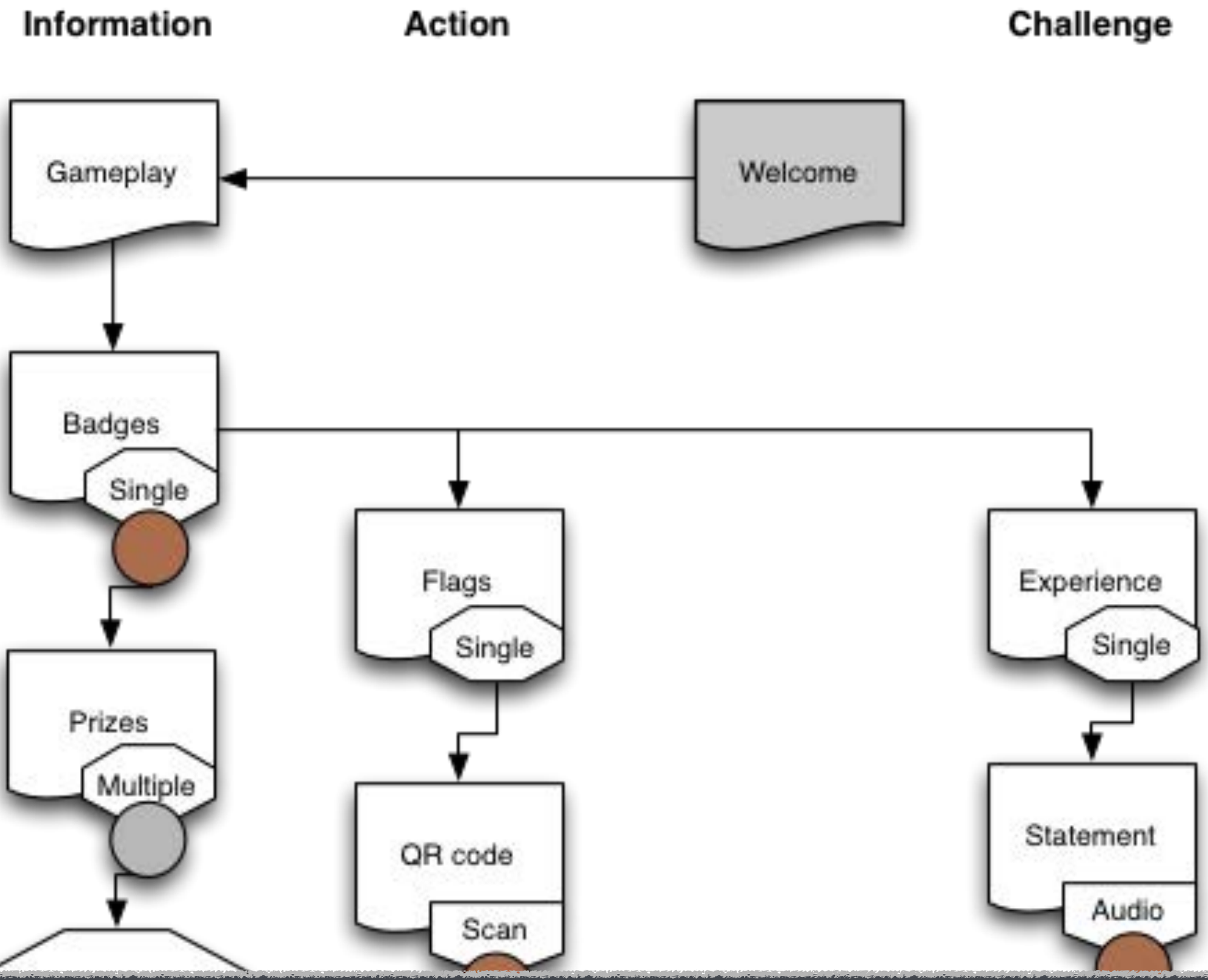
Learning Functions	**Underlying taxonomy elements**	**Game Design Pattern (class)**
Prior Knowledge Activation	Gagné's instructional event of "retrieval" (stimulating recall of prior learning).	Goals patterns, e.g. Reconnaissance (7,18,1)
Motivation	Chiefly, Keller's ARCS model is of relevance here.	Various patterns, mostly score related, for example rewards (4,54,1).
Attention	Both Keller and Gagné list Attention.	Game elements patterns, e.g. Surprises (5,30,16), Clues (1,19,3)
Expectation	Gagné's instructional event of "expectancy" (informing learners of the objective).	Goal related patterns, e.g. Predefined Goals (8,10,2), Narrative patterns e.g. Anticipation (5,22,2)

Mapping game patterns onto pedagogical design patterns



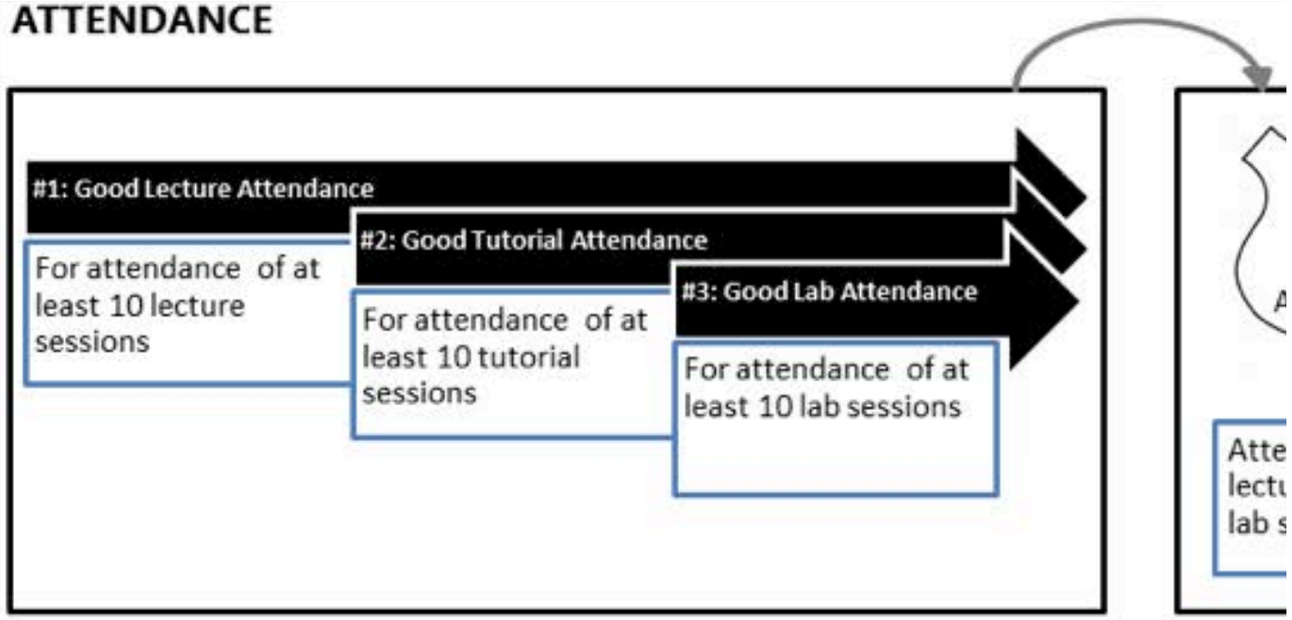
Reflection Amplifiers

context indicators ...

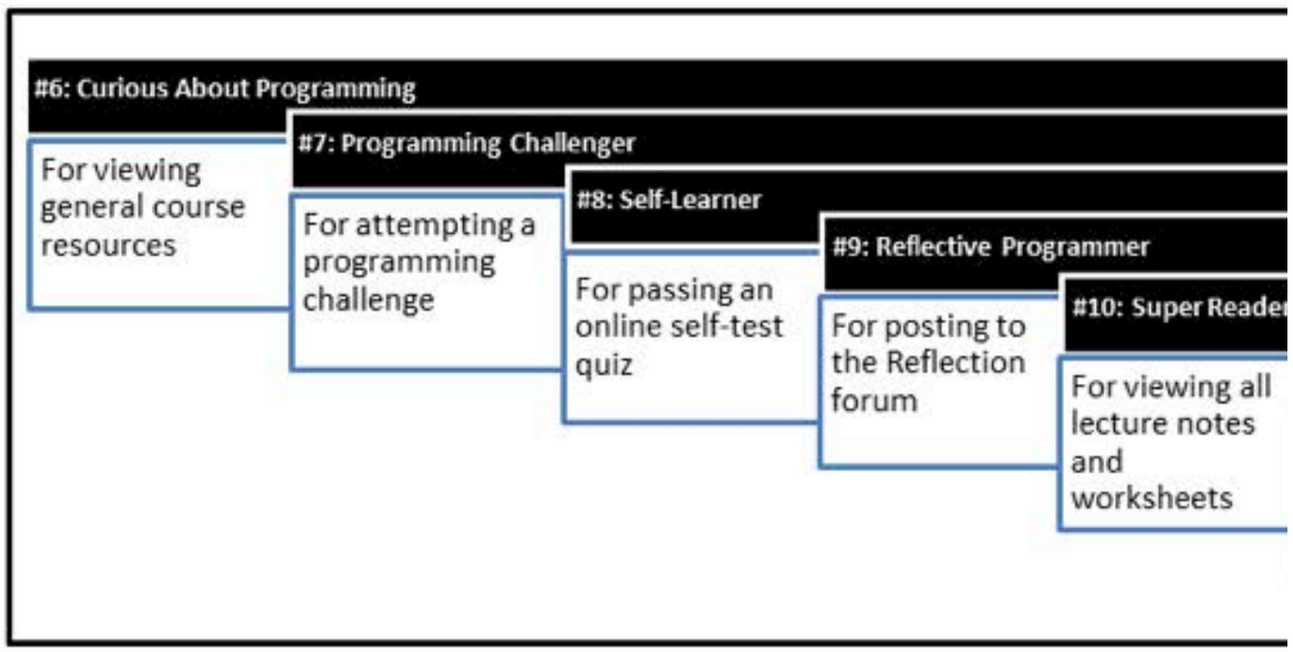


Learning Activities and Badges

ATTENDANCE



PARTICIPATION

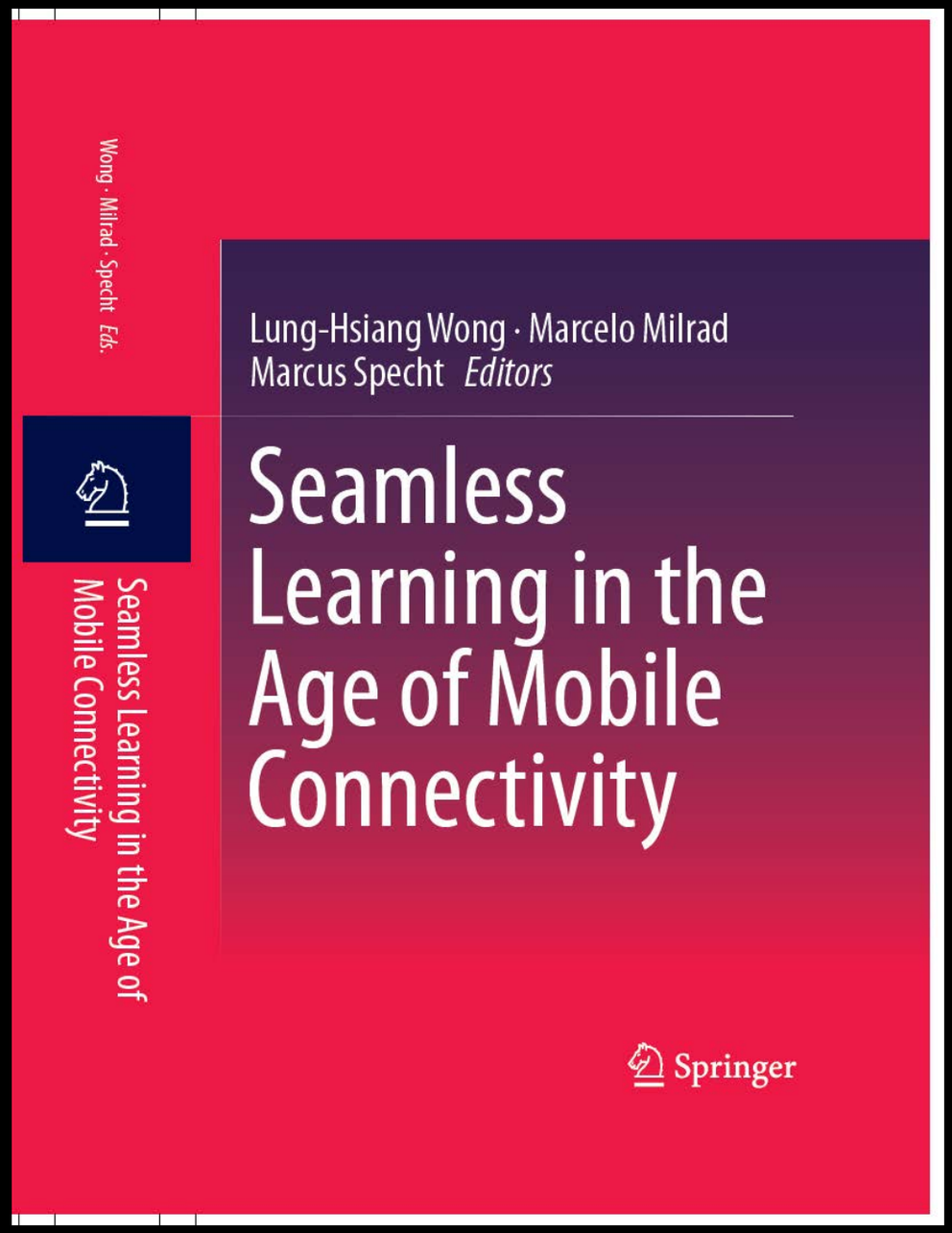


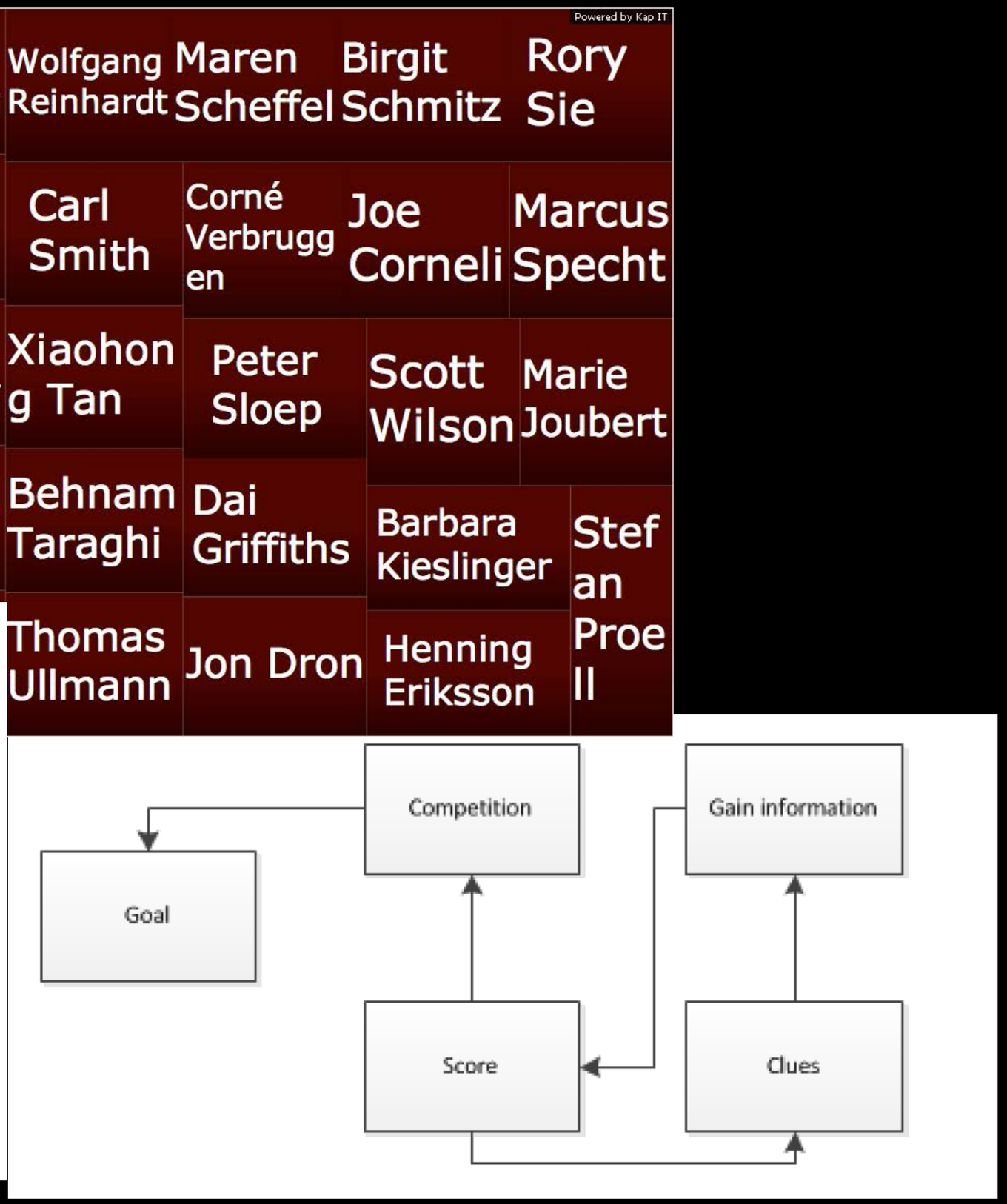
FLOWCHART

Participation		*Little Adventurer
		Super Adventurer
		Challenger
		Super Challenger
		Self-Learner
		Master-Learner
		Reflective Programmer
		Shining Star

badge design for effect

#3 GAMIFICATION IN SEAMLESS LEARNING





Mister X UbiLearn Game

Information **Action** **Challenge**

Gameplay

Welcome

Badges

Single

Flags

Single

Prizes

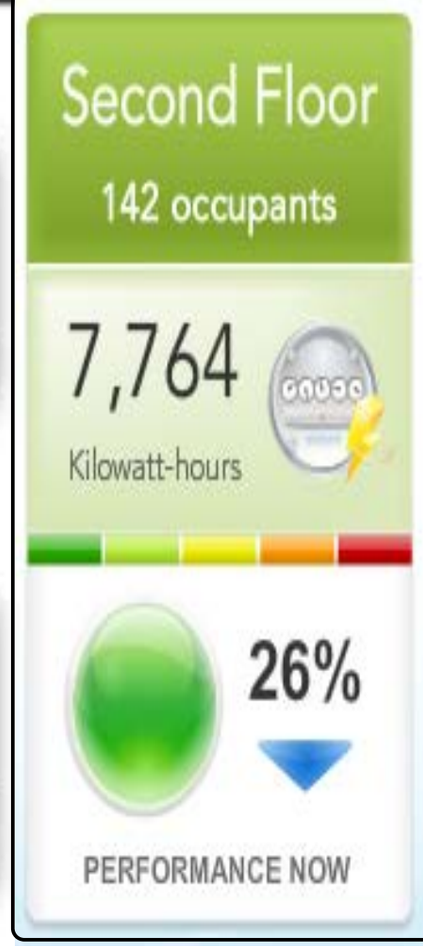
Multiple

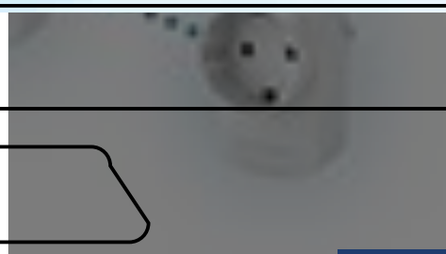
QR code

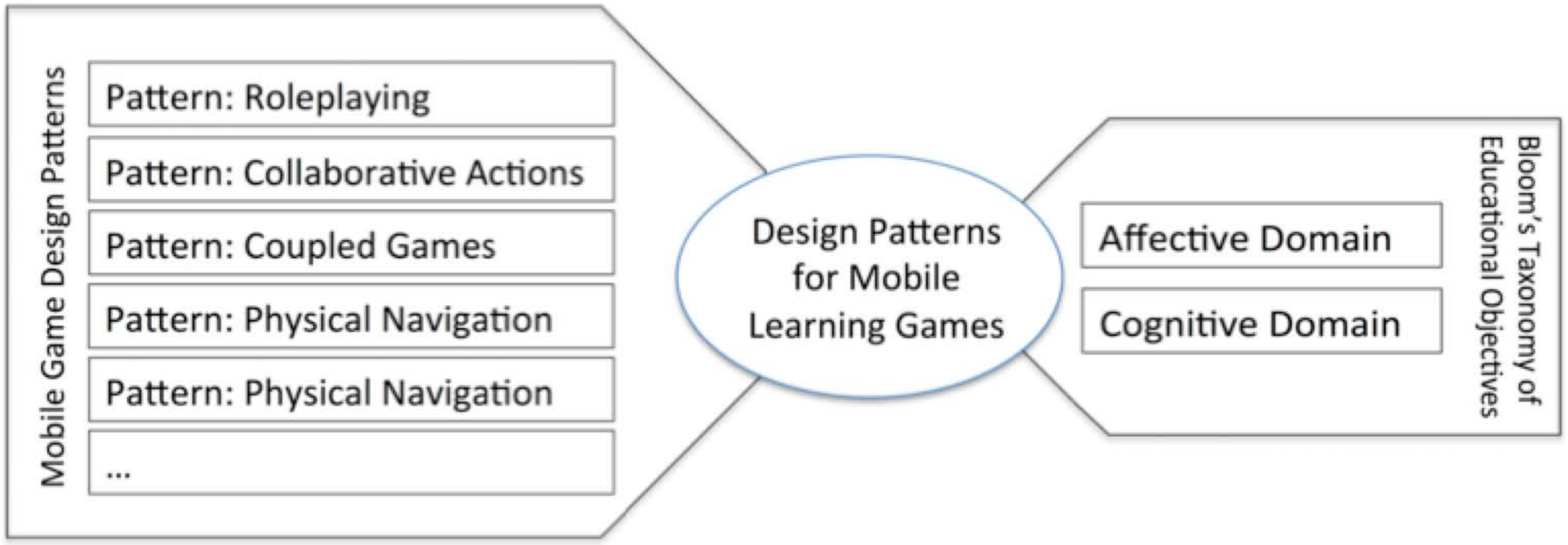
Scan

Quiz

Workplace

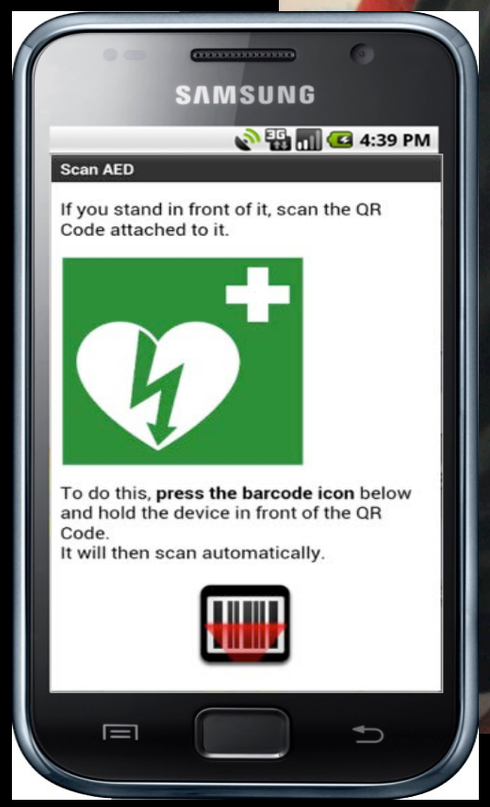






Schmitz, B., Klemke, R., & Specht, M. (2012). Effects of mobile gaming patterns on learning outcomes: A literature review. International Journal of Technology Enhanced Learning, 4(5-6), 345-358. doi: 10.1504/IJTEL.2012.051817
URI: http://hdl.handle.net/1820/5197

Coupled Games are a powerful concept …



Physical Learning Activities Connected in a Mobile Learning script on a phone …

attention-aware displays ...

- raise and retain attention significantly better.
- lead **not** to higher cognitive load but to a significant higher knowledge gain.

PRESENTATION TRAINER

BEST DEMO AWARD - ECTEL 2014

LESSONS LEARNED

LESSONS LEARNED

- Game Design Patterns have powerful effects on motivation, engagement, learning outcomes, and secondary variables

- Multiple Design Options: you need to adapt the implementation of a pattern to your context but can integrate them in Standard Learning Facilities

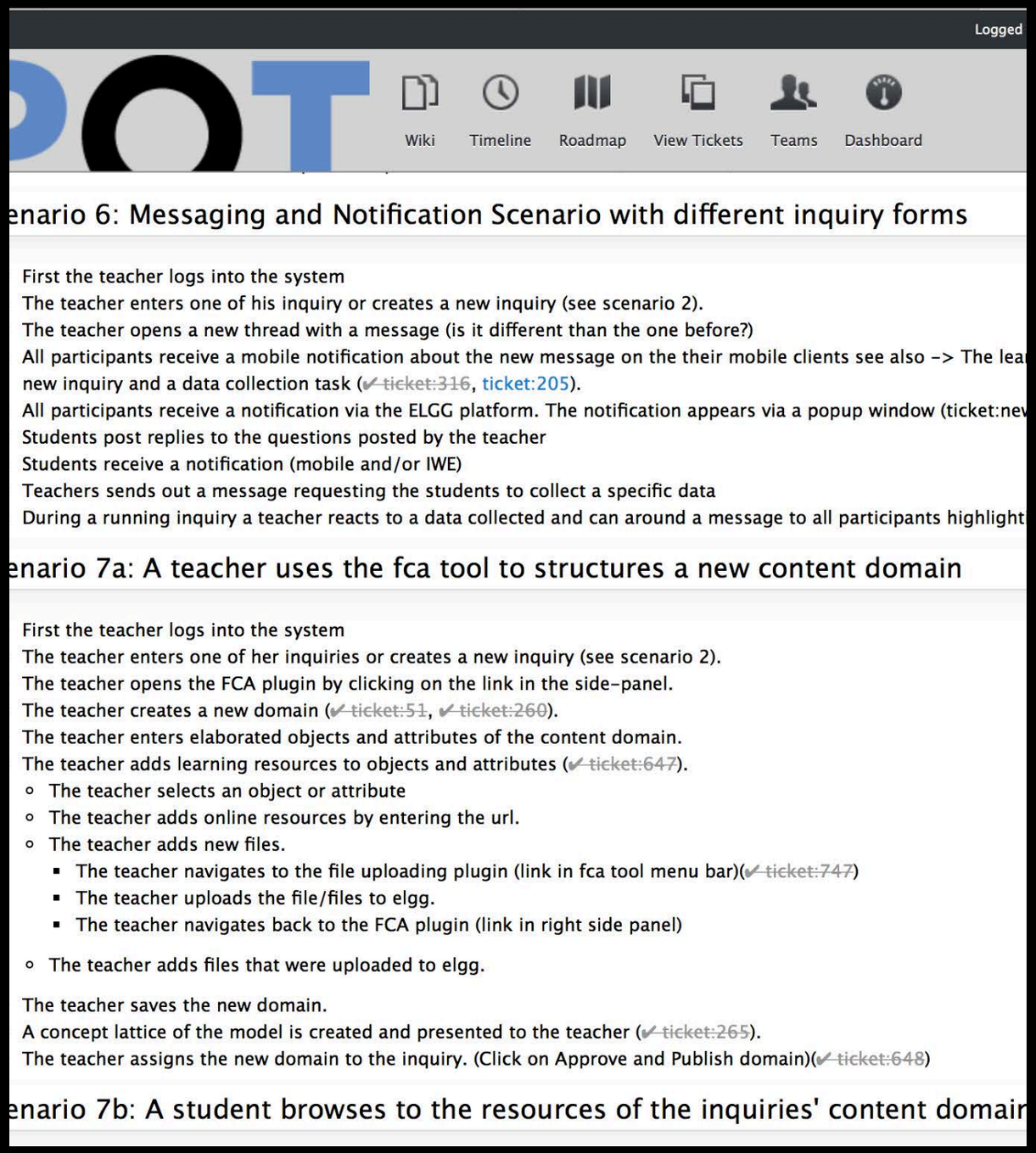
- Specific Patterns support specific phases in learning and instructional process in principle they are always “help to get you started”.

#4 RESEARCH METHODOLOGY

DEVELOP YOUR TECHNOLOGY AGILE ..

FOR BUILDING A COMMON GROUND WITH YOUR "CLIENTS"

user scenarios, early prototypes, early user feedback, foster communication between developers, end users and managers



ADOPTION OF INNOVATION IS CRITICAL ...

LAYERED ADOPTION

Aan alle ouders...

Uw kind zit in groep 8 en uw zoon of dochter is rond de 11,12 jaar. Normaal gesproken betreedt in Nederland iemand rond zijn 25ste de arbeidsmarkt. Dat betekent dat uw kind de verdubbeling van zijn huidige leven nog op school zal zitten! In 2025 neemt uw zoon of dochter de stap om in de maatschappij te gaan werken.

Wij, maar ook anderen (wetenschappers, maar iedereen met gezond verstand) weten dat we één ding weten, dat is dat we slechts bij benadering kunnen bedenken hoe die wereld in 2025 eruit zal zien. Door de snelheid van de technologische ontwikkelingen zal dit ons voorstellingsvermogen te boven gaan. Als wij u in 2000 verteld hadden dat leerlingen in 2013 zouden leren met een iPad als hulpmiddel, dat zijverbonden met elkaar via een internet en communicerend met mobiele telefoons op zakformaat zouden leren, had u zich daar op dat moment dan een concrete voorstelling van kunnen maken?

Stichting Onderwijs Midden Limburg

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ANALYSE THE CONTEXT WELL ...

DESIGN-BASED RESEARCH

MEASURE THE RIGHT THING A TIME ...

ALIGN WITH DEV. LIFE-CYCLE

Development Lifecycle	Evaluation aspect / Variables	*Evaluation Phase*
Design phase (no system)	Requirements Domain Model	Phase A: Conceptual Evaluation
Low-fidelity prototype (mockup)	Usability Usefulness	Phase B: Qualitative and formative
High-fidelity prototype (running components)	Usability Measurement Effectiveness	Phase C: Quantitative and formative
Fully integrated system	Measurement Effectiveness	Phase D: Quantitative and summative

weSPQT

Experimental Designs ...

- raise and retain attention significantly better.
- lead **not** to higher cognitive load but to a significant higher knowledge gain.

HIDDEN VARIABLES CAN BE MORE IMPORTANT …

TEL IN MULTI-VARIATE CONTEXT